CHAPTER IV H

Volta Wildlife Management Area Alternative Plans

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
MID-PACIFIC REGION

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CHAPTER IV H

VOLTA WILDLIFE MANAGEMENT AREA

Volta Wildlife Management Area (Refuge) is owned by Reclamation and has been operated by DFG since 1952 under a lease agreement. The Refuge consists of approximately 3,000 acres of primarily large alkali ponds with waterfowl areas containing aquatic communities, predominantly swamp timothy, bulrush, sprangletop, watergrass, and smartweed. The Refuge is located approximately six miles northwest of the City of Los Banos and within the Grassland Resource Conservation District (GRCD), described in Chapter IV G. The Refuge serves as a control area for ongoing selenium studies.

A. WATER RESOURCES

The Refuge has a firm contract with Reclamation for 10,000 acre-feet of Central Valley Project (CVP) water. The water management plan for the Refuge requires flooding to begin on July 15. This early flooding provides feeding and resting areas for early arriving waterfowl. The Refuge is the first and usually the only area in GRCD to be flooded early in the year (CDFG, 1986b). The Refuge needs additional dependable water supplies to provide optimum management levels.

1. Surface Waters

The CVP water is delivered from the San Luis Reservoir and O'Neill Forebay via the Delta-Mendota Canal (DMC) or Reclamation's Volta Wasteway, as shown in Figure IV H-1. The Refuge also receives water from Volta Lake when the lake water levels are high. Volta Lake is supplied by artesian wells.

2. Water Conveyance Facilities

The Volta Wasteway enters the Refuge at the southwest corner and passes through the center. The water is lifted into two ditches by low lift pumps near Ingomar Grade Road. The ditches convey water to the eastern and western sections of the Refuge. Water flows from the boundary ditches to internal ditches by gravity. The ditch along the southern boundary contains runoff from an adjacent dairy.

Water also is diverted from the Volta Wasteway via outtake pipes located near a check dam in the center of the Refuge. These 18-inch diameter pipes frequently cause hydraulic constrictions.

Grassland Water District (GWD) routes water through the Refuge in the GWD San Luis Wasteway/Mosquito Ditch, which sometimes causes management problems for the Refuge due to fluctuating water levels.

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3. Groundwater

Groundwater levels are usually within 25 feet of the land surface. The groundwater has relatively high boron concentrations and would require surface water for dilution. Although groundwater has not been used as a water supply at the Refuge, the safe yield of the Refuge has been estimated by Reclamation to be 4,200 acre-feet.

B. FORMULATION AND EVALUATION OF ALTERNATIVE PLANS

The DFG estimates that 16,000 acre-feet of water would be required for full development and optimum management of the entire refuge. For the purposes of assessing the impacts of water delivery alternatives, four levels of water supply have been identified and are presented in Table IV H-1. Each of the water supply levels provides a different volume of water, and are summarized as follows:

Level 1 - Existing firm water supply

Level 2 - Current average annual water deliveries

Level 3 - Water supply needed for full use of existing development

Level 4 - Water delivery needed for optimum management

1. Delivery Alternative for Level 1 (No Action Alternative) (10,000 acre-feet)

No additional facilities would be required to provide the existing firm water supply.

2. Delivery Alternative for Level 2 (10,000 acre-feet)

Water Supply Level 2 is equal to Level 1. As discussed above, no facilities would be required to provide the existing firm water supply.

3. Delivery Alternatives for Level 3 (13,000 acre-feet)

Alternative 3A would increase the capacity of the Volta Wasteway. Alternative 3B involves establishment of a conjunctive use program. Alternative 3B also would require implementation of 3A to deliver surface waters during the wet years.

Alternative 3A - Construct Turnout at Main Canal and Upgrade Outtakes. A turnout on the Central California Water District (CCID) Main Canal and a canal to convey water to the Volta Wasteway would be constructed. Water would be supplied to the CCID Main Canal through the Wolfson Bypass which was described in Chapter IV G.

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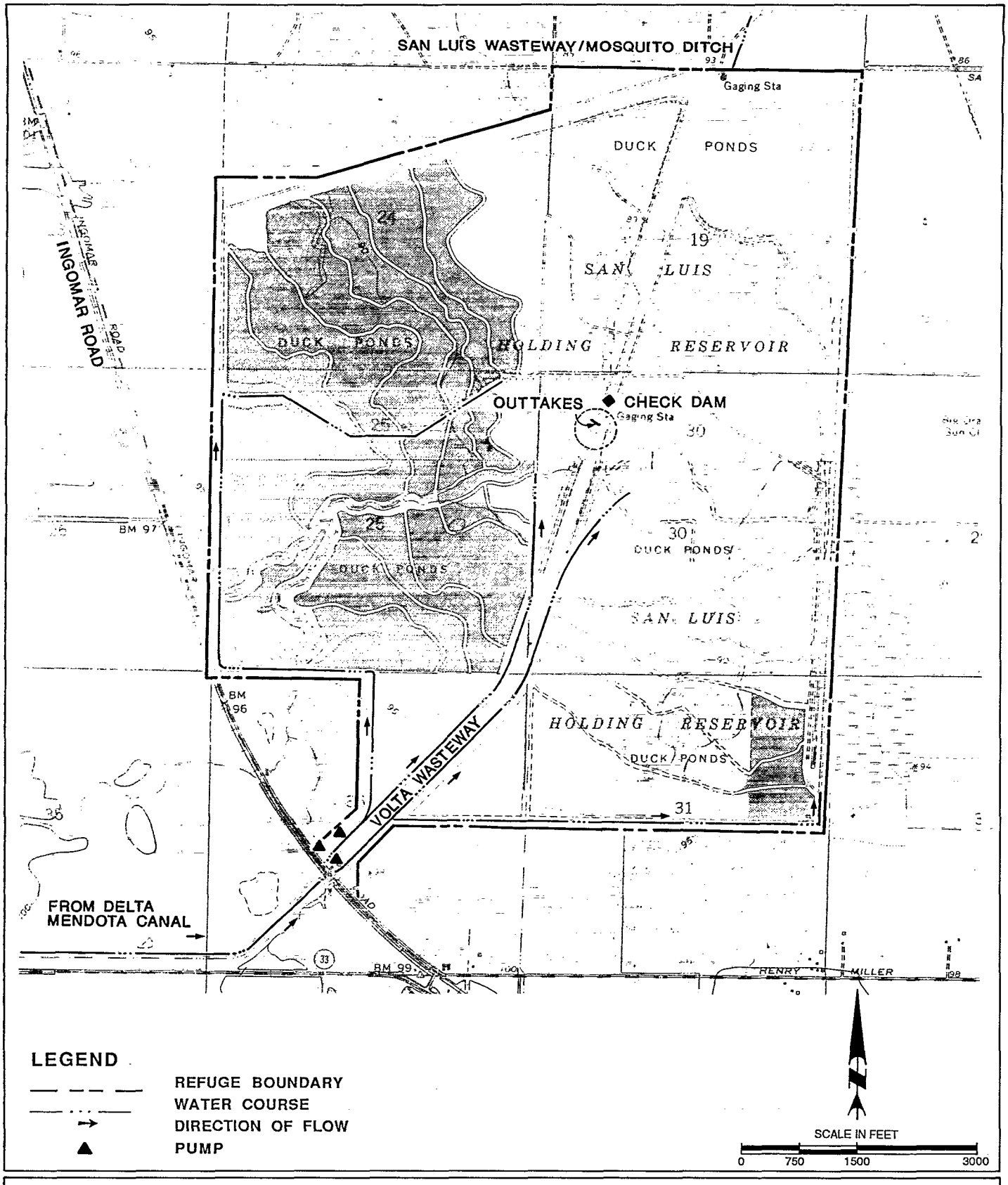

FIGURE IV H-1

VOLTA WILDLIFE MANAGEMENT AREA

EXISTING WATER SUPPLY FACILITIES

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TABLE IV H-1

DEPENDABLE WATER SUPPLY NEEDS

ALTERNATIVE SUPPLY LEVELS FOR THE VOLTA WMA

Month	Supply Level 1 ac-ft	Supply Level 2 ac-ft	Supply Level 3 ac-ft	Supply Level 4 ac-ft
January	200	200	200	500
February	200	200	200	500
March	200	200	200	500
April	200	200	200	500
May	1,000	1,000	2,000	2,000
June	1,200	1,200	2,000	2,000
July	600	600	800	1,800
August	1,400	1,400	1,400	2,400
September	1,800	1,800	1,800	1,800
October	2,000	2,000	2,000	2,000
November	600	600	1,100	1,000
December	600	600	1,100	1,000
Total	10,000	10,000	13,000	16,000

Notes:

Supply Level 1: Existing firm water supply
Supply Level 2: Current average annual water deliveries
Supply Level 3: Full use of existing development
Supply Level 4: Optimum mangement

Source: USFWS, 1986g

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The 18-inch diameter corrugated metal pipe (CMP) outtake located near the check dam in the Volta Wasteway would be replaced by a 24-inch diameter outtake, as shown in Figure IV H-2.

Alternative 3B - Implement a Conjunctive Use Plan. Four wells would be constructed on the Refuge to deliver the maximum month water demand. The exact locations of the wells would be determined in a future study. The wells would be developed as part of a conjunctive use program. During dry years, water demands would be supplied by wells, as discussed in Chapter III. During wet years, the wells would probably not be needed if CVP water is provided. The groundwater contains relatively high concentrations of boron, therefore, surface water may be required to dilute the groundwater.

4. Delivery Alternatives for Level 4 (16,000 acre-feet)

Water deliveries under Level 4 are similar to deliveries under Level 3. The same alternatives considered for Level 3 would be considered for Level 4.

Alternative 4A - Construct Turnout at Main Canal and Upgrade Outtakes. Alternative 4A is identical to Alternative 3A.

Alternative 4B - Implement a Conjunctive Use Plan. Five wells would be constructed on the Refuge to deliver the maximum month water demand. This alternative would be similar to Alternative 3B.

5. Summary of Alternatives

The beneficial and adverse effects of each alternative were compared with respect to criteria listed in Chapter III. There were no alternatives for Levels 1 and 2, the existing firm water supply.

Alternatives 3B and 4B would cause a groundwater overdraft because the water needs would exceed the safe yield under the Refuge. In addition, surface water would be required to dilute the boron concentrations in the groundwater. Alternatives 3B and 4B would require implementation of Alternatives 3A and 4A to provide surface water during the wet years.

C. COSTS AND ECONOMIC ANALYSIS

Costs for the alternative plans to provide adequate water supplies under Levels 2, 3, and 4 are presented in Table IV H-2. The construction costs include factors to cover engineering, contingencies, and overhead. Annual operation and maintenance (O&M) costs include only the local costs to deliver water. The annual O&M costs do not include costs to purchase CVP water. During the advanced planning phase, these costs will be refined further.

Construction of the facilities under all of the alternatives would result in additional money being spent in Merced County

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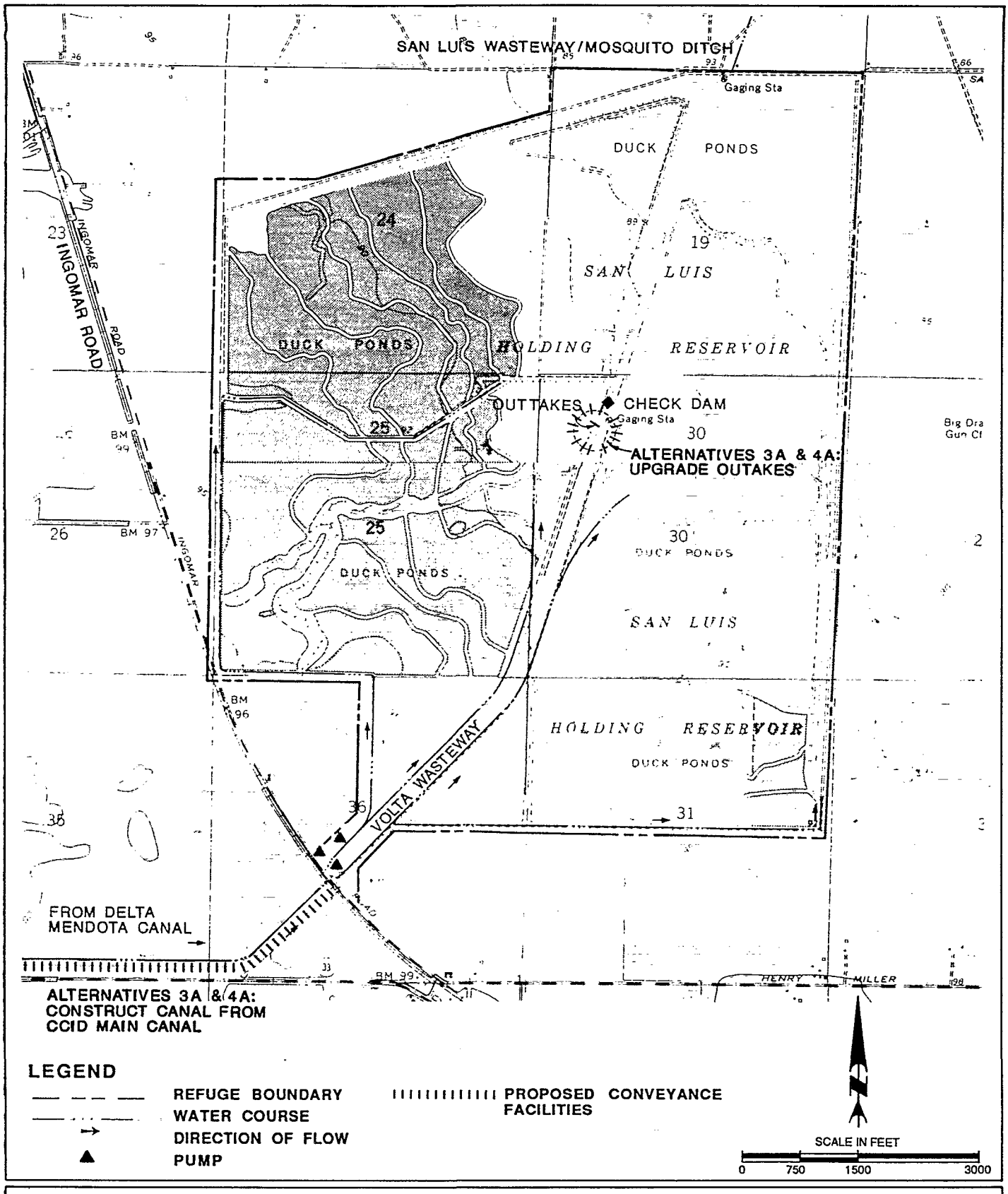

FIGURE IV H-2

VOLTA WILDLIFE MANAGEMENT AREA

ALTERNATIVE WATER SUPPLY FACILITIES

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TABLE IV H-2

SUMMARY OF ESTIMATED COSTS OF ALTERNATIVES

VOLTA WMA

Items	Alternatives 3A	3B	4A	4B
Additional Water (ac-ft)	3,000	3,000	6,000	6,000
Construction Costs				
Wells	$ --	$246,000(b)	$ --	$307,500(d)
Diversion Structures	23,000(a)	--	23,000(a)	--
Pipelines/Canals	--	--	--	--
Pump Stations	--	--	--	--
Subtotal	$ 23,000	$246,000	$ 23,000	$307,500
Other Costs	--	23,000(c)	--	23,000(c)
Total	$ 23,000	$269,000	$ 23,000	$330,500
Annualized Construction Costs (8.87%, 30 yrs)	$ 2,200	$ 25,900	$ 2,210	$ 31,800
Additional Annual Cost				
Operation & Maintenance(e)	$ 500	$ 8,400	$ 500	$ 10,500
Power	--	12,000(g,h)	--	24,000(g,h)
Local Conveyance Cost	2,250(f)	--	4,500(f)	--
Subtotal	$ 2,750	$ 20,400	$ 5,000	$ 34,500
Other Costs	--	1,400(c,h)	--	2,500(c,h)
Total	$ 2,750	$ 21,800	$ 5,000	$ 37,000
Total Annual Costs	$ 4,950	$ 47,700	$ 7,210	$ 68,800
Cost/Additional Acre-Foot	$ 1.70	$ 15.90	$ 1.20	$ 11.50

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TABLE IV H-2

SUMMARY OF ESTIMATED COSTS OF ALTERNATIVES

VOLTA WMA

(Continued)

Notes: Alternatives 3A and 4A - Construct Turnout at Main Canal and Upgrade Outtakes.
Alternatives 3B and 4B - Implement a Conjunctive Use Plan.

(a) Two turnouts, two 24-inch diameter outtake.

(b) 4 wells, 600 feet deep, 70-foot lift.

(c) Alternative 3B would require implementation of Alternative 3A, and Alternative 4B would require implementation of Alternative 4A.

(d) 5 wells, 600 feet deep, 70-foot lift.

(e) Basis for O&M costs are discussed in Appendix F.

(f) Unit Conveyance Cost = $0.75/af.

(g) Unit Pumping Cost = $8/af.

(h) Value is multiplied by 0.5 because facilities are assumed to be used only 5 out of 10 years.

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during construction. The construction could be completed within one summer season by construction workers who reside within the area.

Currently, the annual public use is about 7,000 visits per year. If additional water is provided, the attendance levels would increase.

D. WILDLIFE RESOURCES

The annual bird use in the Refuge is approximately 25,000,000 use-days. The listed threatened and endangered species are the San Joaquin kit fox, Vulpes macrotis mutica; the Valley elderberry longhorn beetle, Desmocerus californicus dimorphus, bald eagle, Haliaeetus leucocephalus; peregrine falcon, Falco peregrines anatum; and Aleutian Canada goose, Branta canadensis leucopareia, as listed in Table IV H-3. Numerous candidate species may occur in this area, as presented in Table IV H-4.

Alternatives 3A and 3B and Alternatives 4A and 4B would improve habitat on the Refuge. The improved habitat would increase the number of wildlife-use days and recreational benefits, as presented in Table IV H-5.

Implementation of any of the alternative plans probably would not adversely affect the listed and candidate threatened and endangered species. Detailed field investigations would be completed during the advanced planning phase of the project. Implementation of the plan would result in overall beneficial environmental effects. The No Action Alternative would result in the management of the refuge under the current water supply conditions. Additional regional environmental analyses would be completed as part of the Water Contracting EIS's.

E. SOCIAL ANALYSIS

The social consequences of constructing and operating the plans would be positive due to the potential increase in wildlife use and subsequently public use.

F. POWER ANALYSIS

The Pacific Gas & Electric Company serves the Refuge under the PA-1 rate schedule for agricultural users. A facility must be an authorized function of the CVP to receive project-use power. The authority to deliver CVP project-use power to the Refuge is currently being examined and will be detailed in the Refuge Water Supply Planning Report. A more detailed discussion of project-use power and wheeling agreements is provided in the Power Analysis section of Chapter II.

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TABLE IV H-3

FISH AND WILDLIFE RESOURCES

VOLTA WMA

Ducks

Pintail[a]
Gadwall[a]
Ring-necked Duck
Mallard[a]
Shoveler[a]
Canvasback
Green-winged Teal
Cinnamon Teal[a]
Ruddy Duck[a]
Widgeon

Geese and Swans

Ross' Goose
Snow Goose
Cackling Goose
Tundra Swan
White-fronted Goose

Coots

American Coot[a]

Shore and Wading Birds

Pied-billed Grebe
White-faced Ibis
Lesser Sandhill Crane
Common Snipe
Long-billed Curlews
Great Blue Heron
Common Egrets
Snowy Egrets
American Bittern
Black-crowned Night Herons
American Avocet
Black-necked Stilt[a]
Dowitchers
Great Yellowlegs
Sandpiper
Killdeer[a]
Rail[a]
Sora[a]
Gallinule[a]

Upland Game

Ring-necked Pheasant[a]
Cottontail Rabbits
Black-tailed Jackrabbits
Dove

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TABLE IV H-3

FISH AND WILDLIFE RESOURCES

VOLTA WMA
(Continued)

Raptorial Birds

Northern Harrier[a]	Red-tailed Hawk[a]	American Kestrel
Black-shouldered Kite[a]	Cooper's Hawk	Turkey Vulture
Sparrow Hawk[a]	Golden Eagle	

Fish

Brown Bullhead	Channel Catfish	Striped Bass
Carp	Large Mouth Bass	

Furbearers

Coyotes	Muskrats	Raccoon
Opossum	Striped Skunk	Grey Fox
Beaver	Mink	Badger
Spotted Skunk		

Notes:

(a) Birds nesting on refuge

Source: Environmental Assessment Reports, Los Banos Wildlife Area, and Refuge records

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TABLE IV H-4

FEDERAL LISTED, PROPOSED, & CANDIDATE, THREATENED & ENDANGERED SPECIES

VOLTA WMA

Listed Species

Mammals

San Joaquin kit fox, Vulpes macrotis mutica (E)

Birds

Bald eagle, Haliaeetus leucocephalus (E)
American peregrine falcon, Falco peregrinus anatum (E)
Aleutian Canada goose, Branta canadensis leucopareia (E)

Invertebrates

Valley elderberry longhorn beetle, Desmocerus californicus dimorphus (T)

Proposed Species

None

Candidate Species

Birds

Swainson's hawk, Buteo swainsoni (2)
White-faced ibis, Plegadis chihi (2)
Western snowy plover, Charadrius alexandrinus nivosus (2)
Tricolored blackbird, Agelaius tricolor (2)

Reptiles

Giant garter snake, Thamnophis couchi gigas (2)
California tiger salamander, Ambystoma tigrinium californiense (2)

Invertebrates

Molestan blister beetle, Lytta molesta (2)

Plants

Hispid bird's-beak, Cordylanthus mollis subsp. hispidus (2)
Delta coyote-thistle, Eryngium racemosum (1)
Bearded allocarya, Plagiobothrys hystriculus (2)
Valley spearscale, Atriplex patula subsp. spicata (2)

Source: USFWS, June 4, 1987

(E)—Endangered (T)—Threatened (CH)—Critical Habitat
(1)—Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(2)—Category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

TABLE IV H-5

WILDLIFE RECREATIONAL BENEFITS AND RESOURCE IMPACTS

VOLTA WMA

	No Action Alternative	Alternatives 3A	3B	4A	4B
Habitat Acres					
Permanent Water	200	225	225	250	250
Brood Water	150	200	200	250	250
Watergrass	50	600	600	850	850
Aquatics	600	550	550	500	500
Un-Irrigated Native Marsh	1,650	1,175	1,175	1,000	1,000
Uplands	350	250	250	150	150
Bird Use Days					
Coots	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Ducks	3,500,000	5,000,000	5,000,000	6,500,000	6,500,000
Geese	300,000	300,000	300,000	300,000	300,000
Wading Birds	200,000	250,000	250,000	300,000	300,000
Shore Birds	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Total	25,000,000	26,550,000	26,550,000	28,100,000	28,100,000
Public Use Days					
Consumptive	3,900	5,600	5,600	7,400	7,400
Non-Consumptive	3,100	4,300	4,300	5,600	5,600
Total	7,000	9,900	9,900	13,000	13,000
Total Annual Cost	--	$ 4,950	$ 47,700	$ 7,210	$ 68,800
Incremental Cost/Additional 1000 Bird Use Days	N/A	$ 3.20	$ 30.80	$ 2.30	$ 22.20
Incremental Cost/Additional Public Use Day	N/A	$ 1.70	$ 16.50	$ 1.20	$ 11.50

Notes: Alternatives 3A and 4A - Construct Turnout at Main Canal and Upgrade Outtakes.
Alternatives 3B and 4B - Implement a Conjunctive Use Plan.

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G. PERMITS

Construction activities would require several permits. Merced County would issue approvals for construction of wells. If the CCID facilities are utilized, their approval would be required. Stream Alteration Permits would be required from the DFG for Alternatives 3A and 4A. An Army Corps of Engineers permit would be required for construction activities in wetlands or riparian corridors under all alternatives.

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